**G.CO.3: Experiment with transformations in the plane**

Focus: describe the rotations and reflections that carry it onto itself.

Developing Understanding Lesson

Using the signs task the students will potentially:

* Surface ideas
* Understand that properties of the figure remain unchanged when rotated or reflected.
* Points of a figure move on coordinate plane when figure is rotated or reflected (what happens to x and y during rotation/reflection)
* Understand properties of quadrants in terms of degrees
* Invent strategies
* Rotate/reflect figure on coordinate plane by examining point values
* Create representation
* Highlight attributes of changes of the reflection/rotations

Solidify Understanding

Using the rotation/reflection art task the students will observe and expand:

* Idea that
* Rules for x and y values for rotations and reflections on the coordinate plane.
* Strategy for:
* Write rules based on their own observations of figures being rotated and reflected.
* Representation:
* Construct a rotation or reflection and use rules to verify new coordinates.

Practice Understanding

* Definition:
* Know definition of rotation/reflection
* Know rules of coordinate values pertaining to rotation/reflection
* Procedure:
* Identify rotations and reflections of given figures.
* Give new coordinates of reflection/rotation.

Good Resources:

Mathisfun.com- geometry-symmetry artist

nlvm.usu.edu- transformations rotations/reflections

Task 1

Go to mathsisfun.com/geometry/symmetry-artist.html.

Use the Symmetry Artist and draw a polygon.

Use each tool to the left of the picture, observe and explain what happens with each tool.

Repeat this process 3 times for each tool.

Class discussion.

Task 2

Divide into groups.

Give them 3 different pictures. They need to reflect and rotate each picture into different quadrants of graph paper each time.

Note observations and develop a rule (conjecture based on observations) for rotation and reflection.

Teacher: match rules by clarifying with an object using the ordered pairs. Showing 90 degree turn in relation to the difference of the ordered pair.

Task 3

Individual Task

Draw a picture using at least 3 different polygons without changing dimensions of the polygons within the picture.

You must have at least 3 different types of rotations and reflections in the picture.

Number and explain each of the rotations and reflections.